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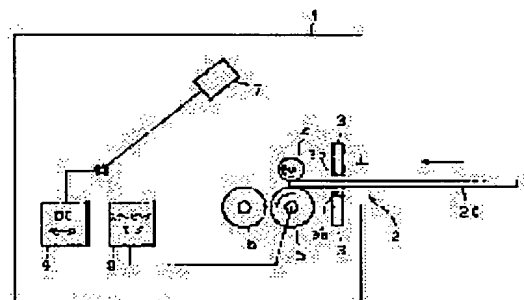
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(54) PRINTING DEVICE

(57)Abstract:

PURPOSE: To enable presentable printing always regardless of the size of sheets by grasping the size of a printing sheet, and adjusting a printing start position on the basis of this size.

CONSTITUTION: In the inserted state of a sheet 20, a CPU rotates a feed roller 5 in the intake direction by a stepping motor 8. During this intake action, the stepping number of the stepping motor 8 is counted by a counter, and when the rear end of the sheet 20 passes the position of a sensor 3, the driving of the motor 8 is stopped and the count number is confirmed. Hereupon, whether the sheet size is sufficient in relation to the size of a printed image is discriminated. In the case of the sheet 20 being of the printable size, the adjustment quantity is computed so that printing is at the center of the sheet face, for instance, on the sheet 20. The stepping motor 8 is driven by this adjustment quantity, and after the sheet 20 is fed into a printing start position, a printing head 7 is brought into contact with the sheet 20 by a DC motor 9 to start a printing process.



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CLAIMS

[Claim(s)]

[Claim 1] In the printing equipment which can perform printing actuation to the inserted print sheet An edge detection means by which the edge of a print sheet is detectable, and a paper feed means to perform inhalation and discharge of a print sheet, Print sheet size is distinguished from the feed per revolution by said paper feed means to the form end position of the print sheet detected by said edge detection means. The printing equipment characterized by having the control means which computes the printing starting position on a print sheet based on the print sheet size, drives said paper feed means so that printing may be started from the printing starting position concerned, and adjusts the location of a print sheet.

[Claim 2] It is the printing equipment according to claim 1 characterized by having the form inhalation / exhaust port made to serve a double purpose as the inhalation section and the discharge section of a print sheet, allotting said edge detection means between said form inhalation / exhaust ports, and paper feed means, and being constituted so that the existence of a print sheet may be detected.

[Claim 3] Said control means is a printing equipment according to claim 1 characterized by controlling not to perform printing when not fulfilling the space size which needs the distinguished print sheet size for printing.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the printing equipment which prints an image etc.

[0002]

[Description of the Prior Art] Usually, in the printing equipment, the printing starting position is set up regardless of the size (especially size of the feed direction of a form) of a print sheet. For example, a printing starting position is set up as a location of what mm from the tip of a form, and printing is performed.

[0003]

[Problem(s) to be Solved by the Invention] Although such a setup is not a problem especially in the printing equipment with which the paper size is decided, un-arranging arises in the printing equipment which a user can print using the form of to some extent arbitrary sizes.

[0004] For example, the printing equipment which can print on a postcard etc. the image which the user created is considered. For example, in consideration of 148x100mm which is the standard size of a postcard, printing image size presupposes that it is set up with 109x76mm. in this case — if it thinks that the form (for example, postcard) of standard size is always inserted in a printing equipment, and it is printed and printing will be started in the location of 20mm from the tip of a form with a die length [that] of 148mm — drawing 10 (a) — like — that printing image (slash section PD) — a postcard (form P) — do in the center mostly — it becomes what has good appearance.

[0005] However, when not only the postcard of standard size but a user wants to print on the postcard by which die-length sizes differ, or when it seems that a user wants to create a card etc. using the form of the size of arbitration, there is a problem that a printing image will be made in a good location.

[0006] For example, the printing image PD shown that Form P is long as the slash section to Form P like drawing 10 (b) serves as a location which inclined toward the point, and when Form P is short, like drawing 10 (c), the printing image PD is made in the location which inclined toward the back end section, and becomes what has appearance bad [all].

[0007] Moreover, as a big problem, although printing is made on the form by which a pressure welding is carried out between the print head and a platen roller, when a form is short and all forms have been sent ahead of the print head during printing, it may be referred to as that printing will be made on a platen roller here. For example, when it is not able to print in the short form P like drawing 10 (d), the print which remains (broken-line part) will be made on a platen roller, and a platen roller will be soiled greatly. The dirt of a platen roller will soil the form inserted after that, or will cause the fall of a roller function.

[0008]

[Means for Solving the Problem] This invention aims at preventing printing of a up to [a platen roller] while it was made in view of such a trouble and can perform decent printing in location to the various forms of the size of arbitration.

[0009] For this reason, it sets to the printing equipment which can perform printing actuation to

the inserted print sheet. An edge detection means by which the edge of a print sheet is detectable, and a paper feed means to perform inhalation and discharge of a print sheet, Print sheet size is distinguished from the feed per revolution by the paper feed means to the form end position of the print sheet detected by the edge detection means. Based on the print sheet size, the printing starting position on a print sheet is computed, and the control means which drives a paper feed means and adjusts the location of a print sheet so that printing may be started from the printing starting position concerned is established.

[0010] Here, it has the form inhalation / exhaust port made to serve a double purpose as the inhalation section and the discharge section of a print sheet, and an edge detection means is constituted so that it may be allotted between form inhalation / exhaust port, and a paper feed means and the existence of a print sheet may be detected.

[0011] Moreover, a control means is made to control not to perform printing, when not fulfilling the space size which needs the distinguished print sheet size for printing.

[0012]

[Function] By grasping the size of a print sheet and adjusting a printing starting position based on the size, it cannot be concerned with the size of a form but always decent printing can be performed.

[0013] Moreover, the size of the form inserted by the paper feed means is correctly detectable with an easy configuration based on the feed per revolution by the paper feed means until an edge detection means detects form end position by allotting the edge detection means between form inhalation / exhaust port, and the paper feed means.

[0014] Furthermore, when the distinguished paper size does not fulfill size required as a print sheet, it is stopping printing, and it can prevent that printing will be made by the platen roller.

[0015]

[Example] Hereafter, drawing 1 - drawing 9 explain one example of this invention. Drawing 1 shows the structure of the printing equipment of an example typically. Form opening for 1 showing the whole printing equipment, and 2 inserting a form in this printing equipment 1, and discharging a form is shown.

[0016] The sensor 3 which detects the existence of the form in the location is formed in the interior of the form opening 2. A sensor 3 is formed of light emitting diode 3a and photo transistor 3b, and is made as [receive / light / by photo transistor 3b / the output light from light emitting diode 3a]. Therefore, when the light-receiving detection output by photo transistor 3b is not obtained when a form exists in the gap parts of this light emitting diode 3a and photo transistor 3b, and a form does not exist, the light-receiving detection output by photo transistor 3b will be obtained, and this can detect the existence of the form in that location.

[0017] A pinch roller 4 and a feed roller 5 are formed in the method of inside as carriage from a sensor 3. A feed roller 5 rotates with a stepping motor 8. When the form is inserted, the pressure welding of the form is carried out by the feed roller 5 and the pinch roller 4 from vertical side both sides, therefore if a feed roller 5 rotates leftward (counterclockwise rotation) in drawing with a stepping motor 8, a form will be sent in the inhalation direction, and when a feed roller 5 rotates in the direction of drawing Nakamigi (clockwise rotation) with a stepping motor 8, a form will be sent to an eject direction.

[0018] 6 shows a platen, 7 shows the print head, and the print head 7 is made as [move / by DC motor 9 / the location / between the location shown as a continuous line, and the position in readiness shown with an alternate long and short dash line]. If the print head 7 is made into the location shown as a continuous line in case a form is on a platen 6, a form will be ****(ed) by a platen 6 and the print head 7, and printing by the print head 7 will be performed by form space in this condition.

[0019] Drawing 2 shows the internal circuitry of this printing equipment 1, and shows a counter [in / 10 and / in 11 / the interior of CPU]. [a control section (CPU)] CPU10 is made as [distinguish / by incorporating the detection output by the sensor 3, i.e., the output of photo transistor 3b / the trailer of the form inserted]. Moreover, CPU10 also performs drive control to DC motor 9 and a stepping motor 8. In case drive control of a stepping motor 8 is performed, it is constituted so that the number of steps can be counted with a counter 11.

[0020] In this printing equipment 1, CPU10 will perform processing of drawing 3 at the time of printing actuation. Hereafter, drawing 3 and drawing 4 – drawing 8 explain printing actuation. As for printing actuation, a user operates the actuation switch which is not illustrated after inserting a form from the form opening 2, and it is made to be started in the actuation information being inputted into CPU10. In addition, a user inserts a form from the form opening 2, and when a sensor 3 detects existence of a form, you may make it started automatically.

[0021] For example, when a user inserts a form from the form opening 2, as shown in drawing 4, the tip of the form 20 will be pushed in to the gap parts of a feed roller 5 and a pinch roller 4. Here, if a user performs printing actuation, as for CPU10, the information from a sensor 3 will detect the existence of a form 20 first (F101). When a user performs printing actuation in the condition that the form 20 is not inserted, it is judged at step F101 that he has no form, and printing actuation is not performed. That is, it progresses to step F113 and printing termination processing and form discharge processing (drive of the eject direction of a feed roller 5) are performed.

[0022] In the state of drawing 4 in which the form 20 was inserted, processing will progress to step F102, and with a stepping motor 8, as for CPU10, a feed roller 5 is rotated in the inhalation direction, as the drawing Nakaya mark shows. And in CPU10, the number of steps of a stepping motor 8 will be counted with the counter 11 during this inhalation actuation (F103).

[0023] inhalation and the number-of-steps count of a form 20 are continued till the time (at the back end detection time of a form 20) of the back end of a form 20 passing through the location of a sensor 3 like drawing 5, that is, having no form being detected by the sensor 3 (F103, F104) — processing of CPU10 progresses to step F105 at the time of this drawing 5, and the drive of a stepping motor 8 is stopped. And the number of counts in the counter 11 at the time is checked.

[0024] It becomes a numeric value for grasping the size of the number of counts 20 at this time, i.e., the inserted form. If a form 20 sets to c die length inhaled at one step of a stepping motor 8, sets the number of counts to X and sets distance from a sensor 3 to a feed roller 5 to b like drawing 5, it is the size SP of the inhalation direction of a form. It is computable as $SP = (cX+b)$. Here, it is size SP to the size of a printing image. It distinguishes whether it is enough (F106). the size of a printing image is 109mmx76mm — carrying out — contact location (printing position) PS of a feed roller 5 to the print head 7 up to — if distance is set to a — size SP of the inhalation direction of a form The above (109+a) is indispensable.

[0025] Since the maximum inhalation location of a form turns into a location where the back end of a form 20 is pinched by the feed roller 7 and the pinch roller 4 (discharging will become impossible if it inhales more than it), the part of a will be because all printing images cannot be printed on a form 20, if printing will not be possible, therefore (109+a) does not have the above size.

[0026] when it is distinguished that it is the size ($SP < (109+a)$) which cannot print the inserted form 20 by this step F106, it will progress to step F113, printing will be stopped, drawing Nakamigi rotation of the feed roller 5 will be carried out by the step INGU motor 8, and a form 20 will be discharged.

[0027] By this processing, it is prevented by performing printing, while the size of a form 20 has been insufficient that printing will be performed on a platen 6. In addition, the decision with an actual enough/inadequate paper size is number-of-steps SP, even if it does not compute form height specially at this time, since distance a is a fixed value and printing image size is also immobilization in that printing equipment at this time. What is necessary is just to compare with a predetermined value.

[0028] When it considers as the size which can print a form 20 next, processing by which printing is made on a form 20 in a decent location (for example, center of space) will be performed. That is, the printing position PS It receives, and the printing starting position on space is computed and form justification is carried out. if printing is made by the part of drawing 5 which attached the slash as a location of a feed direction in the form 20 — a printing image — a form 20 — it will be mostly made in the center. Therefore, the location of a form 20 is adjusted as shown in drawing 6 (in the case of this example, predetermined length inhalation is carried out further),

and it is the printing position PS. It adjusts so that the printing starting position on space may face.

[0029] Here, if the die length (109mm in the above-mentioned example) of Y and a printing image is set to Z for the feed per revolution (number of steps of a stepping motor 8) of the form 20 for this adjustment actuation, feed-per-revolution Y for adjustment can compute the amount Y of adjustments for printing in the center of space as $Y = (X \text{ and } c + b - Z) / 2 - a / c$.

[0030] Thus, if the amount Y of adjustments is computed (F107), only the Y step will drive a stepping motor 8 (F108), and will make a form 20 the location condition of drawing 6. In addition, according to die-length Z of a printing image, it is set further, and the paper feed for adjustment may become [the distance of a / in / in Y at this time / the size X and each equipment of a form /, and b, and] both the inhalation direction and an eject direction (Y becomes a forward value or a negative value).

[0031] Thus, if a form is sent to inhalation or an eject direction by adjustment number-of-steps Y, the print head 7 will be made to contact a form 20 like drawing 6 with DC motor 9 (F109), and printing processing will be started (F110). That is, a feed roller 5 is rotated in the drawing Nakaya mark direction like drawing 7, and the form 20 prints by the print head 7 with delivery to the eject direction. and a printing image — if all printed (F111), like drawing 8, the print head 7 is returned to a position in readiness, a form 20 will be discharged and printing actuation will be finished so that it may illustrate further.

[0032] the above printing actuation — a user — ***** — even if it inserts the form of size and performs printing, it is shown, for example in drawing 9 (a) – (b) — as — the printing image (slash section) PD — space — do to a mid gear mostly — the balance to a form becomes the good thing which has good appearance.

[0033] In addition, although printing was made in the center of space abbreviation in the above example while considering printing image size as immobilization, it is also possible to adjust, for example by setting actuation of a user, so that it may become the location which changed printing image size or shifted the printing position on a form from the center purposely. What is necessary is just to change the value of Z in the formula which asks for Above Y according to the setup, when printing image size is changed. Moreover, what is necessary is just to adjust the numeric value according to the amount of gaps also by setup which shifts the printing position purposely. $Y = \{(X - c + b - Z) / 2 - a + \alpha\}$ What is necessary is just to set up the value of alpha as /c according to a setup of inhalation or the amount of gaps of an eject direction.

[0034] Moreover, various modification is possible for the structure as a printing equipment besides an example. For example, it has the motor which replaces with counting the number of steps of a stepping motor 8, and has the pulse generating sections, such as FG and PG, pulse count is performed, and you may make it grasp a paper size.

[0035]

[Effect of the Invention] The printing equipment of this invention grasps the size of a print sheet as having explained above, and by adjusting a printing starting position based on the size, it is not concerned with the size of a form but is effective in the ability to perform always decent printing. Moreover, the size of the form inserted by the paper feed means is correctly detectable with an easy configuration based on the feed per revolution by the paper feed means until an edge detection means detects form end position by allotting the edge detection means between form inhalation / exhaust port, and the paper feed means. Furthermore, when the distinguished paper size does not fulfill size required as a print sheet, it is stopping printing, and it is effective in the ability to prevent that printing will be made by the platen roller, and can prevent that the form by the dirt of a platen roller being soiled and a malfunction occur.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the explanatory view of the structure of one example of the printing equipment of this invention.

[Drawing 2] It is the explanatory view of a circuit block of the printing equipment of an example.

[Drawing 3] It is the flow chart of the printing motion control of the printing equipment of an example.

[Drawing 4] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 5] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 6] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 7] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 8] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 9] It is the explanatory view of the printing image by the printing equipment of an example.

[Drawing 10] It is the explanatory view of the printing image by the conventional printing equipment.

[Description of Notations]

- 1 Printing Equipment
- 2 Form Opening
- 3 Sensor
- 4 Pinch Roller
- 5 Feed Roller
- 6 Platen
- 7 Print Head
- 8 Stepping Motor
- 9 DC Motor
- 10 CPU
- 11 Counter
- 20 Form

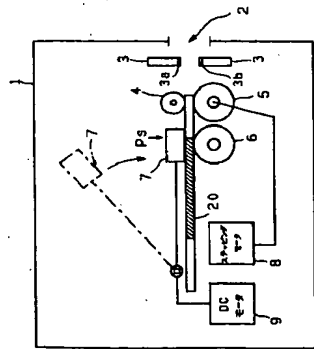
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- が用紙端位置を検出するまでの紙送り手段による送り量に基づいて容易な構成で正確に検出できる。
- 【0014】さらに、判別された用紙サイズが印刷用紙として必要なサイズに満たないときは印刷を中止することと、プラテンローラに印刷がなされてしまうことを防止できる。
- 【0015】
- 【実施例】以下、図1～図9により本発明の一実施例を説明する。図1は実施例のプリント装置の構造を模式的に示したものである。1はプリント装置全体を示し、2は、このプリント装置1に用紙を挿入し、また用紙を排出するための用紙口を示す。
- 【0016】用紙口2の内側には、その位置における用紙の有無を検出するセンサ3が設けられている。センサ3は例えば発光ダイオード3a及びフォトランスタクタ3bにより形成され、発光ダイオード3aからの出力光がフォトランスタクタ3bによって受光できるようになされている。従って、この発光ダイオード3aとフォトランスタクタ3bの間隙部分に用紙が存在するときは、フォトランスタクタ3bによる受光検出出力が得られず、また、用紙が存在しないときはフォトランスタクタ3bによる受光検出出力が得られることになり、これによってその位置における用紙の有無を検出できる。
- 【0017】センサ3より内方には紙送り機構としてピンチローラ4及びフィードローラ5が設けられる。フィードローラ5はステッピングモータ8によって回転されるものである。用紙が挿入されている際にはフィードローラ5とピンチローラ4によって用紙が上面両側から圧接されており、従ってフィードローラ5がステッピングモータ8によって図5の方向（反時計方向）に回転されると用紙は吸入方向に送られ、またフィードローラ5がステッピングモータ8によって図6の方向（時計方向）に回転されると用紙は排出方向に送られることとなる。
- 【0018】6はプラテン、7は印刷ヘッドを示し、印刷ヘッド7はDCモータ9によってその位置が実線で示す位置と、一点鎖線で示す待機位置との間で移動されるようになされている。用紙がプラテン6上にある際に印刷ヘッド7が実線で示す位置とされると、用紙がプラテン6と印刷ヘッド7に接触されることになり、この状態で用紙紙面に印刷ヘッド7による印刷が実行される。
- 【0019】図2はこのプリント装置1の内部回路を示しており、10は制御部（CPU）、11はCPU内部におけるカウンタを示す。CPU10はセンサ3による検出出力、即ちフォトランスタクタ3bの出力を取り込むことで、挿入された用紙の終端を検出してその位置にわたっている。また、CPU10はDCモータ9及びステッピングモータ8に対する駆動制御も行う。ステッピングモータ8の駆動制御を行う際には、そのステッピングモータ8のカウント数によって図6の方向に構成されて
- いる。
- 【0020】このプリント装置1では、印刷動作時にCPU10が図3の処理を実行することになる。以下、印刷動作について図3及び図4～図8により説明する。印刷動作は例えば用紙が用紙口2から挿入したうえで図示しない操作スイッチをユーザが操作し、その操作情報が入力されることにより開始されるようにする。なお、ユーザが用紙を用紙口2から挿入し、センサ3が用紙の存在を検知することによって自動的に開始されるようにしてもよい。
- 【0021】例えばユーザが用紙を用紙口2から挿入する場合、図4に示すようにその用紙20の先端はフィードローラ5とピンチローラ4の間隙部分まで押し込まれることとなる。ここで、ユーザが印刷操作を行うと、CPU10はまずセンサ3からの情報により、用紙20の有無を検出する（F101）。もし用紙20が挿入されている状態であるならば、印刷操作は実行され、ステッピングモータ8が印刷操作を行なった場合は、フィードローラ5で用紙なしと判断され、印刷動作は実行されない。つまりステッピングモータ8が印刷動作を行なっていない状態であるならば、フィードローラ5の排出方向の駆動が行なわれる。
- 【0022】用紙20が挿入された図4の状態では処理はステッピングモータ8に進むことになり、CPU10はステッピングモータ8によりフィードローラ5を図5の方向に示すように吸入方向に回転させる。そして、この吸入動作の間、CPU10においてはカウンタ11によりステッピングモータ8のステッピング数をカウントしていくことになる（F103）。
- 【0023】用紙20の吸入及びステッピング数は、図5の方向に用紙20の後端がセンサ3の位置を通過し、つまり、センサ3によって用紙なしと検出される時点（用紙20の後端検出時点）まで継続され（F103、F104）、この図5の時点でCPU10の処理はステッピングモータ8のステッピングモータ8の駆動を停止させる。そして、その時点のカウント数11におけるカウンタ数を増設する。
- 【0024】この時点のカウント数は、即ち挿入された用紙20のサイズを把握するための数値となる。用紙20がステッピングモータ8の1ステッピングで吸入される長さc、カウンタ数をXとし、図5の方向にセンサ3からフィードローラ5までの距離をbとすると、用紙の吸入方向のサイズSpは $Sp = (cX + b)$ として算出できる。ここで、印刷画像のサイズに対してサイズSpが十分であるかを判断する（F106）。印刷画像のサイズが例えば $109\text{mm} \times 76\text{mm}$ であるとし、フィードローラ5から印刷ヘッド7の当接位置（印刷位置）P5までの距離をaとすると、用紙の吸入方向のサイズSpは $(109 + a)$ 以上となればならない。
- 【0025】用紙の最大吸入位置は用紙20の後端がフィードローラ7とピンチローラ4に挟まれている位置と

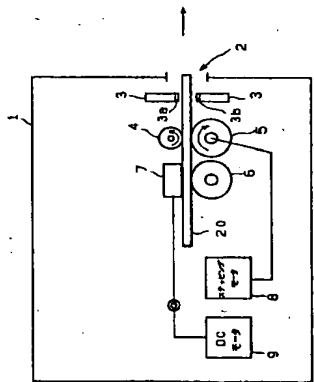
- なるため（それ以上吸入すると排出不能となる）、aの部分以上は吸入できないことになり、従って $(109 + a)$ 以上のサイズがなければ印刷画像をすべて用紙20上に印刷できないためである。
- 【0026】このステッピングモータ8により、挿入された用紙20が印刷可能なサイズ $(Sp < (109 + a))$ であると判断された場合は、ステッピングモータ8の駆動を中止し、ステッピングモータ8によりフィードローラ5を図6の方向に回転させ、用紙20を排出することになる。
- 【0027】この処理により、用紙20のサイズが足りないまま印刷を実行することで、プラテン6上に印刷が実行されてしまうことが防止される。なお、実際の用紙サイズが十分／不十分の判断は、そのプリント装置において距離は固定値であり、また印刷画像サイズもこの時点では固定値であるため、わざわざこの時点で用紙を検出して計算しなくても、ステッピング数Spのみで所定値と比較すればよい。
- 【0028】用紙20が印刷可能なサイズとされた場合は、次に、印刷が用紙20上で正確な良い位置（例えば紙面中央）になされるようにする処理を行なうこととなる。つまり、印刷位置P5に対して紙面上の印刷開始位置を算出して用紙位置調整する。例えば図5の用紙20において送りの方向の位置として斜線を付した部分に印刷がなされると、印刷画像は用紙20のほぼ中央になされることとなる。従って、用紙20の位置を図6に示すように調整し（この例の場合にはさらに所定長吸入する）、印刷位置P5に紙面上の印刷開始位置が相対するようになり調整される。
- 【0029】ここで、この調整動作のための用紙20の送り量（ステッピングモータ8のステッピング数）をY、印刷画像の長さ（上記例における 109mm ）をZとすると、調整のための送り量Yは、 $Y = (X \cdot c + b - Z) / 2 - a$ として算出される。印刷が用紙20の中央に行なうための調整量Yを算出するとして、印刷が紙面中央に行なうための調整量Yを算出する。
- 【0030】このように調整量Yを算出したら（F107）、そのYステッピングモータ8を駆動し（F108）、用紙20を図6の位置状態と調整する。なお、このときのYは、用紙のサイズXや、各装置におけるa、bの距離、さらに印刷画像の長さZに応じて定められるものであり、調整のための紙送りは吸入方向と排出方向のいずれにもなる場合がある（Yは正の値または負の値となる）。
- 【0031】このように調整ステッピング数Yにより用紙を吸入又は排出方向に送った後、DCモータ9により図6のように印刷ヘッド7を用紙20に当接させ（F109）、印刷動作を開始する（F110）。即ち、図7のようにフィードローラ5を図5の方向に回転させて用紙20は排出方向に送りながら印刷ヘッド7により印刷を行なっている。

- く、そして印刷画像をすべて印刷されたら（F111）、図8のように印刷ヘッド7を待機位置に戻し、さらに図示するように用紙20を排出して印刷動作を終える。
- 【0032】以上の印刷動作により、ユーザが各種異なるサイズの用紙を挿入して印刷を実行させても、例えば図9（a）～（b）に示すように、印刷画像（斜線部）PDは紙面のほぼ中央位置になされ、用紙に対するバランスがよく、体積の良いものとなる。
- 【0033】なお、以上の実施例では、印刷画像サイズは固定とするとともに、印刷は紙面中央になされるようにしたが、例えばユーザの設定操作により、印刷画像サイズを変更したり、用紙上の印刷位置をわざと中央よりずれた位置となるように調整することも可能である。印刷画像サイズを変更した場合は、その設定に応じて上記Yを求めた式においてZの値を変更すればよい。また、わざと印刷位置をずらすような設定によっても、そのずれ量に応じて数値を加減すればよい。例えば $Y = (X \cdot c + b - Z) / 2 - a + \alpha$ として、 α は排出方向のずれ量の設定に応じてZの値を設定すればよい。
- 【0034】また、プリント装置としての構造は実施例以外にも各種変更可能である。例えばステッピングモータ8のステッピング数をカウントすることに代えてFG、PG等のパルス発生部を有するモータを備えて、パルスカウンタを行なって用紙サイズを把握するようにしてもよい。
- 【0035】
- 【発明の効果】以上説明したように本発明のプリント装置は、印刷用紙のサイズを把握して、そのサイズに基づいて印刷開始位置を調整することにより、用紙のサイズに問わず常に体積の良い印刷を行なうことができるという効果がある。また、端部検出手段が用紙吸入／排出と紙送り手段の間に配されていることにより、紙送り手段によって挿入されていく用紙のサイズは、端部検出手段が用紙端位置を検出するまでの紙送り手段による送り量に基づいて容易な構成で正確に検出できる。さらに、判別された用紙サイズが印刷用紙として必要なサイズに満たないときは印刷を中止することと、プラテンローラに印刷がなされてしまうことを防止できるという効果もあり、プラテンローラの汚れによる用紙が汚れることや動作不良が発生することを防止できる。
- 【図面の簡単な説明】
- 【図1】本発明のプリント装置の一実施例の構造の説明図である。
- 【図2】実施例のプリント装置の回路ブロックの説明図である。
- 【図3】実施例のプリント装置の印刷動作制御のフローチャートである。
- 【図4】実施例のプリント装置の印刷動作の説明図である。

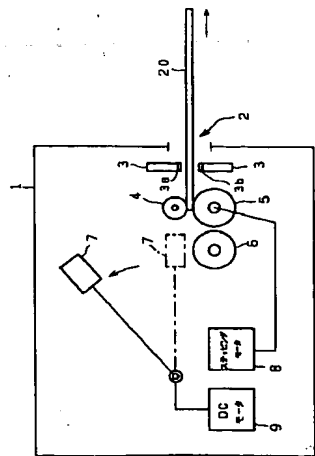
【図6】



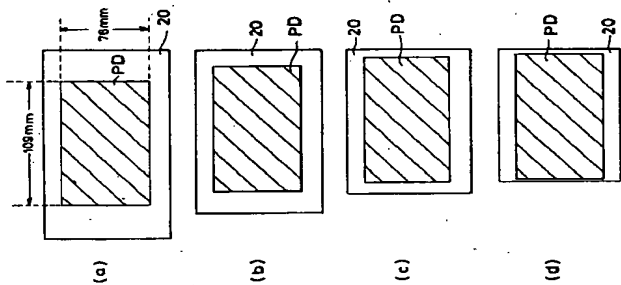
【図7】



【図8】



【図9】



【図10】

